U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Sideroxylon reclinatum* Michx. ssp. *austrofloridense* (Whetstone) Kartesz & Gandhi

COMMON NAME: Everglades bully

LEAD REGION: 4

INFORMATION CURRENT AS OF: October 2005

STATUS/ACTION:

___ Species assessment - determined species did not meet the definition of endangered or threatened under the Act and, therefore, was not elevated to Candidate status

___ New candidate

_X_ Continuing candidate

_X_ Non-petitioned

___ Petitioned - Date petition received:

__ 90-day positive - FR date:

__ 12-month warranted but precluded - FR date:

__ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:

a. Is listing warranted (if yes, see summary of threats below)?

b. To date, has publication of a proposal to list been precluded by other higher priority listing actions?

c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.

___ Listing priority change

Former LP: ___

New LP: ___

Date when the species first became a Candidate (as currently defined): May 4, 2004

___ Candidate removal: Former LP: ___

___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

___ F – Range is no longer a U.S. territory.

___ I – Insufficient information exists on biological vulnerability and threats to support listing.

___ M – Taxon mistakenly included in past notice of review.

___ N – Taxon does not meet the Act's definition of "species."

___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Flowering plants, Sapotaceae, Sapodilla Family

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Florida, U.S.A.

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Florida, Miami-Dade and Monroe Counties, U.S.A.

LAND OWNERSHIP
Nearly all of the plants and habitat are in Everglades National Park and Big Cypress National Preserve. Less than one percent of the plants and habitat are owned by Miami-Dade County, and less than one percent are privately owned.

LEAD REGION CONTACT: Richard Gooch, 404-679-7124

LEAD FIELD OFFICE CONTACT: South Florida Ecological Services Office, David Martin, 772-562-3909 ext 230

BIOLOGICAL INFORMATION
Species Description: *Sideroxylon reclinatum* is a decumbent or upright shrub, 1-2 m (3-6 feet) tall. The branches are smooth, slightly geniculate and somewhat spiny. Leaves are thin, obovate or ovate, 2-5 centimeters long, evergreen, oblanceolate, and fuzzy on their undersides. The flowers are in axillary cymes (Brown 1944, Long and Lakela 1971). Everglades bully is distinguished from the other two subspecies of *S. reclinatum* in Florida by its leaves, which are persistently pubescent (fuzzy) on their undersides, rather than smooth or pubescent only along the midvein (Wunderlin 1998).

Taxonomy: The genus *Sideroxylon* is represented by eight species in Florida. All of these plants were previously assigned to the genus *Bumelia*. *Sideroxylon reclinatum*, the Florida bully, is represented by 3 subspecies that range nearly throughout Florida and into neighboring states. The Everglades subspecies was first recognized by David Whetstone (1985) as *Bumelia reclinat*a var. *austrofloridense*. The new variety was published in the Annals of the Missouri Botanical Garden (Whetstone 1985). The Everglades bully was transferred to the genus *Sideroxylon* by Kartesz and Gandhi (1990). The transfer of Everglades bully from *Bumelia* to *Sideroxylon* is presumably in accordance with Pennington's (1990, 1991) revision of the genera of the family Sapotaceae, and constitutes a nomenclatural formality. Kartesz and Gandhi made *Sideroxylon reclinatum* ssp. *austrofloridense* a subspecies rather than a variety; in plant nomenclature, the ranks of variety and subspecies are interchangeable, except in the situation where two or more varieties constitute a subspecies. This name is used in the current treatment of the Florida flora (Wunderlin 1998, Wunderlin and Hansen 2003).

Habitat: Everglades bully is restricted to pinelands with tropical understory vegetation on limestone rock (pine rocklands), mostly in the Long Pine Key area of Everglades National Park,

which is an area of pine rockland surrounded by wetlands. Everglades bully is also present in Big Cypress National Preserve and urban Miami-Dade County in similar vegetation.

At Long Pine Key, *Sideroxylon reclinatum* (under the name *Bumelia reclinata*) was present in 64 percent of 73 permanent one-tenth acre plots (33 x 132 feet or roughly 10 x 40 meters) (Olmstead et al. 1983). *Bumelia reclinata* was one of the more uniformly present shrubs along with 18 shrub-layer plant species that were at least as uniformly present. Because this survey was prepared before subspecies *austrofloridense* was recognized, it is not clear whether all the *Sideroxylon reclinatum* on Long Pine Key belongs to subspecies *austrofloridense* or whether subspecies *reclinatum* is also present since both subspecies are present in Everglades National Park (Gann et al. 2003).

Everglades restoration is currently being planned, and one objective is to provide more water to the Taylor Slough area and rehydrate the area around Long Pine Key. Everglades bully and other pine rockland plants may have colonized adjacent, lower habitats in the years since water flows were reduced, so restoration of historic water levels might slightly reduce the amount of suitable habitat for this species. Since Everglades bully occurred on Long Pine Key before water flows were reduced, and is currently abundant on the Key, we do not anticipate adverse effects to this species.

Historical Range/Distribution: Everglades bully was long considered to be restricted to the tropical pinelands of Miami-Dade County. Gann et al. (2002) provide a history of collections: Everglades bully was first collected at Camp Jackson near what is now the main entrance to Everglades National Park. It has been collected several times (starting in 1852) at Long Pine Key, an "island" of limestone-rock pineland surrounded by wetlands within Everglades National Park. *S. reclinatum* ssp. *austrofloridense* has also been collected in pinelands east of Everglades National Park, the Nixon-Lewis Hammock (where the pinelands have since been destroyed), privately owned Grant Hammock (which needs to be surveyed), and Pine Ridge Sanctuary, a 5.7 hectare (14 acre) privately-owned preserve. Publicly-owned pineland remnants outside of Everglades National Park have been inventoried for endemic plants, and the data have been summarized in Gann et al. (2002). *Sideroxylon reclinatum* ssp. *austrofloridense* is easily recognizable and, given the intensity of inventories of Miami-Dade pinelands, there is little chance that large populations have been missed in this county, although the recent discovery of plants at Larry and Penny Thompson Park (Maschinski 2005) shows that small populations may still be found.

Current Range/Distribution:

- Big Cypress National Preserve in the mainland portion of Monroe County. This is a recent discovery, in an area that is difficult of access (The Institute for Regional Conservation 2005).
- Long Pine Key in Everglades National Park in Miami-Dade County.
- Larry and Penny Thompson Park (operated by Miami-Dade County, with 93 hectares [229 acres] of natural area) in the Richmond pinelands adjacent to the Metrozoo (Gann et al. 2002).

- The privately-owned 14-acre Pine Ridge Sanctuary in Miami-Dade County (K. Bradley, The Institute for Regional Conservation, in litt. 2005). It may also be present in a few non-protected pinelands, such as Grant Hammock (Gann et al. 2002).

Population Estimates/Status: We do not yet have a good estimate of the population size in Big Cypress National Preserve. *Sideroxylon reclinatum* (under the name *Bumelia reclinata*) was present in 64 percent of 73 permanent one-tenth acre plots (33 x 132 feet or roughly 10 x 40 meters) (Olmstead et al. 1983). Because the report was prepared before subspecies *austrofloridense* was recognized, it is not clear whether all the *Sideroxylon reclinatum* on Long Pine Key belongs to subspecies *austrofloridense* or whether subspecies *reclinatum* is also present on Long Pine Key since Everglades National Park has both subspecies (Gann et al. 2003). During a 2005 survey, more than 10,000 plants were found on Long Pine Key (K. Bradley in litt. 2005). Larry and Penny Thompson Park has 41 tagged groups of plants, each group consisting of one to six individuals, for a total of approximately 73 individuals (Possley and McSweeney 2005). This is probably the largest population outside of Long Pine Key.

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

The Miami-Dade County pine rocklands have largely been destroyed by urban and agricultural development. Pine rocklands in the county (including patches of marl prairie) have been reduced to about 11 percent of their former extent (Kernan and Bradley 1996). Of the estimated historical extent of 74,000 hectares (182,780 acres), only 8,140 hectares (20,106 acres) of pine rocklands remained in 1996. Outside of Everglades National Park, only about 1 percent of the Miami Pine Rock Ridge pinelands remain, and much of what is left is in small remaining blocks isolated from other natural areas (Herndon 1998).

Somewhat different figures for the original extent of pine rocklands and their losses are provided in the South Florida Multi-Species Recovery Plan (U.S. Fish and Wildlife Service 1999): approximately 65,450 ha (161,660 acres), with approximately 8,029 ha now remaining in Everglades National Park. Dade County Department of Environmental Resources Management (1995) reported that in 1990, 375 pine rockland fragments totaling nearly 1,780 ha (4,400 acres) remained. These fragments averaged only 4.9 ha (12.1 acres) in size, and ranged from 0.4 ha (1 acre) to 345 ha (853 acres).

Sideroxylon reclinatum ssp. *austrofloridense* is known to occur on conservation lands only at Big Cypress National Preserve (extent of population uncertain), Long Pine Key (8,029 ha or 19,839 acres), Larry and Penny Thompson Park (93 ha or 229 acres), and the privately-owned Pine Ridge Sanctuary (5.7 ha or 14 acres). It may be present in a few non-protected pinelands, such as Grant Hammock (Gann et al. 2002).

Pinelands in Miami-Dade County outside of Everglades National Park are kept intact only by constant maintenance, including removal of exotic pest plants (Burmareed [*Neyraudia reynaudiana*], Brazilian pepper [*Schinus terebinthifolius*], and others),

prescribed fires, and prevention/cleanup of dumped trash. In areas such as Larry and Penny Thompson Park, the water table is now lower than it was historically, which is possibly stressing the slash pines and other plants.

Long Pine Key and Big Cypress National Preserve are susceptible to invasive exotic plants such as Burmareed and Old World climbing fern (*Lygodium microphyllum*), which has spread southward into parts of Everglades National Park (Ferriter 2001, Ferriter et al. 2003, Gann et al. 2002). Old World climbing fern is capable of smothering vegetation and is spreading rapidly in Florida (Ferriter 2003, Langland 2001, Volin et al. 2003). The former agricultural lands of the Hole in the Donut adjacent to Long Pine Key are infested by invasive plants such as Brazilian pepper (*Schinus terebinthifolius*) and common guava (*Psidium guajava*) (Whiteaker and Doren 1989) and are a potential source of seeds of these invasives. The National Park Service is restoring those former agricultural lands, but until this work is complete, there is a threat of pest plants invading the remainder of Long Pine Key.

Exotic pest plant control at Miami-Dade County's Larry and Penny Thompson Park has been successful. The County policy to conserve pinelands on public lands is important to preventing encroachment into the park's pine rockland. For example, after Hurricane Andrew, debris was dumped on the park's undeveloped pineland while lawns and a mango orchard were spared. The County stopped this practice and moved dumping to areas without important biological resources. There is little likelihood that the water table at Larry and Penny Thompson Park can be raised to something closer to the historic situation. There is little documentation of the effects of drainage, but local biologists are concerned that this has been bad for the health of slash pines and may have benefited shrubs at the expense of grasses. The pineland at Larry and Penny Thompson Park occupies 200 acres, according to Miami-Dade County Parks and Recreation.

Long Pine Key may be affected by Everglades restoration. Gann et al. (2002) and Herndon (1998) express concern that changes to regional water management intended to restore the Everglades could negatively affect the pinelands of Long Pine Key.

B. Overutilization for commercial, recreational, scientific, or educational purposes. Bullies are not likely to be collected for any purpose other than voucher specimens to document their distribution; there is no threat from this source.

C. Disease or predation. Not a threat.

D. The inadequacy of existing regulatory mechanisms. The Florida Department of Agriculture and Consumer Services cannot list *S. reclinatum* ssp. *austrofloridense* because only full species are eligible for listing as endangered or threatened species under chapter 5B-40, Florida Administrative Code.

E. Other natural or manmade factors affecting its continued existence. Fire suppression is a threat to *S. reclinatum* ssp. *austrofloridense*. Fire maintains the pine rockland community. Under natural conditions, lightning fires typically occurred at 3- to 7- year intervals, or more frequently in marl prairies. With fire suppression, hardwoods eventually invade pine rocklands and shade out understory species. Fire suppression has reduced the size of the areas that do burn and habitat fragmentation has prevented fire from moving across the landscape in a natural way. Thus, many pine rockland communities are becoming tropical hardwood hammocks. Exotic species have altered the type of fire that occurs in pine rocklands. Historically, pine rocklands had an open low understory where natural fires remained patchy, with relatively low temperatures, thus sparing many native grasses and shrubs. Dense exotic plant growth can create much higher temperatures and longer burning periods. Pine rockland plants cannot tolerate these extreme conditions. As a result, the native plants may have to be conserved by removing exotics through methods other than burning. One such method, hand chopping followed by spot treatment, is labor intensive and very costly.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

Everglades National Park is a conservation area whose pinelands are managed to maintain the natural vegetation. There do not seem to be critical problems with invasive exotic plants on Long Pine Key. Everglades restoration will review the protection of the uplands of Long Pine Key as water flow into the surrounding Everglades wetlands is restored. The Federal government, through the Service, funded control of exotic pest plants and restoration of Larry and Penny Thompson Park and neighboring pinelands before and after Hurricane Andrew, which devastated the area. The National Park Service has worked to control melaleuca and other pest plants on its south Florida lands. The State of Florida has a policy on invasive exotic species. Fairchild Tropical Botanic Garden, in cooperation with The Institute for Regional Conservation, has tagged plants and constructed a detailed map of this species in Larry and Penny Thompson Park (Possley and McSweeney 2005).

SUMMARY OF THREATS (including reasons for addition or removal from candidacy, if appropriate) The primary threats to Everglades bully are nearly complete loss of habitat in the urban and farmlands of Miami-Dade County, along with exotic pest plants affecting the remaining populations in Everglades National Park and Big Cypress National Preserve. Specifically, Old World climbing fern is rapidly spreading southward into these National Park properties and is capable of damaging natural vegetation on a massive scale.

For species that are being removed from candidate status:

___Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE)?

RECOMMENDED CONSERVATION MEASURES

LISTING PRIORITY:

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	**Imminent**	Monotypic genus	7
		Species	8
		Subspecies/population	**9***
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude: The magnitude of the threats to this plant is moderate because it has fairly extensive habitat available within Everglades National Park on Long Pine Key and at Big Cypress National Preserve. The habitat is managed for conservation, and the National Park Service has controlled exotic pest plants and maintained an appropriate fire regime. Nevertheless, serious threats from exotic pest plants remain and may be difficult to counteract.

Imminence: The threats from currently-present exotic pest plants, though moderate, are imminent, due to constant pressure on the habitat from invasive/exotic species that have the potential to change the fire regime.

Yes Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? No. Threats are moderate to low, and are being addressed by land managers.

DESCRIPTION OF MONITORING

The principal threat to Everglades bully is exotic pest plants, especially Old World climbing fern (Volin et al. 2003). Land managers are using herbicide-based control measures, and biological control agents for Old World climbing fern are being evaluated. The National Park Service is preparing a comprehensive draft environmental impact statement (EIS) on the effects of exotic pest plant management its properties in southern Florida, to be released in late 2004. This EIS will include an assessment of effects on the Everglades bully.

Water flows through Everglades National Park are expected to increase as Everglades ecosystem restoration progresses. However, current planning for Everglades restoration is to restore historic water regimes. Since the Service is involved in this restoration, effects to the Everglades bully will be considered. Although still in the planning stages, biologists working on this restoration expect beneficial effects to the Long Pine Key ecosystem, including the Everglades bully.

Although Everglades National Park does not actively monitor Everglades bully, it is sponsoring a project to assemble historic data on species occurrences and field work for a broad array of imperiled plant species. The single site with Everglades bully outside of Everglades National Park is Larry and Penny Thompson Park, managed by Miami-Dade County. The park was visited by Service personnel in early 2004 and appeared in excellent condition, showing the long-term benefits of removal of debris and exotic pest plants after hurricane Andrew and of prescribed fires since then. Fairchild Tropical Botanic Garden, in cooperation with The Institute for Regional Conservation, has mapped the population of Everglades bully at Larry and Penny Thompson Park (Possley and McSweeney 2005). The Institute for Regional Conservation has conducted field work leading to a number of significant new localities for rare plants in Big Cypress National Preserve.

COORDINATION WITH STATES

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment: The Florida Endangered Plant Advisory Council, a body organized by the Florida Department of Agriculture and Consumer Services, reviews all Federal plant listing actions in Florida.

Indicate which State(s) did not provide any information or comments: N/A

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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: /s/ Jeffrey M. Fleming 11/16/2005
Acting Regional Director, Fish and Wildlife Service Date

Concur: _____ _____
Director, Fish and Wildlife Service Date

Do Not Concur: _____ _____
Director, Fish and Wildlife Service Date

Date of annual review: October 2005

Conducted by: South Florida (Vero Beach) Field Office